SOUTH AFRICAN COMPETITION POLICY ON EXCESSIVE PRICING AND ITS RELATION TO PRICE GOUGING DURING THE COVID-19 DISASTER PERIOD

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Abstract

The declaration of a state of national disaster in South Africa, due to the COVID-19 pandemic, was followed by excessive-pricing regulations pertaining to certain consumer and medical products and services. The regulations and their application suggest an intertemporal benchmark to judge excessive pricing, deviating from previous practice. Intertemporal comparisons assume a structural shift during COVID-19 that changes competitive conditions, related to changes in consumer behaviour. Such comparisons must also account for demand and cost changes. While the COVID-19 regulations allow for cost-based price increases, demand-based increases are not explicitly accounted for, suggesting that the regulations are framed more generally as price-gouging regulations. The differences between price-gouging and excessive-pricing benchmarks depends on the type of disaster-period demand shock. They are similar following a transitory demand spike, provided sufficient time is allowed for dynamic price behaviour, but differ markedly when demand is elevated for the duration of the disaster period. Applying simple cost-based comparisons in recently concluded cases against smaller retailers are consistent with excessive pricing, given the presence of a demand spike. To the extent that these involve persistently higher demand, cases against wholesalers and larger retailers will be more complicated, as such demand must be reflected in competitive prices.

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1. INTRODUCTION

Extreme exogenous shocks to the economic system (due to war or natural disaster) may bring surges in demand for various goods and services and disruption to supply, often producing sharp acceleration in prices. During such times, regulations against price gouging – especially in relation to basic food and other consumer items – may form part of the policy response. Accordingly, following declaration of a state of national disaster due to the COVID-19 pandemic, the South African Minister of Trade, Industry and Competition published regulations pertaining to the pricing and supply of certain consumer and medical products and services[1] during the disaster period.

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1   The regulations pertain to four broad groups of products and services: *(i)* basic food and consumer items; *(ii)* emergency products and services; *(iii)* medical and hygiene supplies; and *(iv)* emergency clean-up products and services.

While consistent with price-gouging concerns internationally, the COVID-19 pricing regulations in South Africa focus predominantly on competition policy, and its associated institutions, as the preferred tool for addressing price gouging concerns. This raises several important policy questions. As shown later in this paper, since their promulgation, the COVID-19 regulations have been widely applied in relation to the conduct of *small* firms in narrow geographic markets. This expansive use of the regulations represents a break with past practice: historically, excessive-pricing enforcement have been limited to specific settings, usually large corporates including Sasol and Mittal and in markets with a particular policy history. One of the key implications is that market power is viewed differently during the COVID-19 period, with competition authorities justifying intervention on the basis of the "temporary" market power wielded by these small players.

Furthermore, the COVID-19 regulations have specific implications for judging when a price is to be considered excessive. This is the central concern in excessive-pricing investigations and a primary reason for the circumscribed application of this area of competition law internationally. As argued later, the COVID-19 regulations require a retrospective comparison of prices during the disaster period with those charged during the pre-disaster period. While the benchmark allows for cost-based increases, the surge in demand associated with the disaster period raises significant policy questions about the relationship between excessive-pricing investigations – which traditionally allow for both demand and cost considerations – and price-gouging investigations – in which policy-makers explicitly seek to dampen demand-based price increases following a disaster.

This paper studies how both the changes in assessing market power and the subsequent changes in assessing excessive pricing accord with competition economics principles. The paper starts with an overview of market power concerns during the COVID-19 disaster period and a summary of South African competition policy towards excessive pricing, including the new regulations. This is followed by a discussion of competitive benchmarks used in judging excessive pricing, emphasising the utility of intertemporal comparisons, also in relation to COVID-19 cases. Drawing on an econometric methodology borrowed from the cartel damages literature, a subsequent section offers simulation evidence that highlights the differences and similarities between excessive-pricing and price-gouging benchmarks under different demand conditions. Finally, the paper compares these insights to the approach adopted by the competition authorities in recently concluded COVID-19 cases in South Africa.

2. MARKET POWER CONCERNS DURING THE COVID-19 CRISIS

Competition policy is concerned with regulating the conduct of firms that enjoy market power, which is the ability to sustain price above marginal cost (Motta, 2008). Policy concerns typically centre on so-called exclusionary conduct by a dominant[2] firm, which aims at harming competitors and, indirectly, consumers. Selected jurisdictions also target exploitative conduct aimed at directly harming consumers, even if no competitor is

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[2]   In competition law, there is often a hierarchical distinction between dominance and market power. This paper uses the terms interchangeably, as the distinction is not of key concern in determining benchmark competitive prices, which is the focus of this paper.

adversely affected. Competition policy against exploitative abuses by a dominant firm – such as charging so-called excessive prices – is contentious. The United States does not prohibit dominant firms from charging high prices, for fear of stifling innovation.[3] In contrast, South African competition law, following that of the European Union,[4] prohibits dominant firms from charging so-called excessive prices.

The new excessive-pricing regulations signal a policy concern that the probability, and consumer-welfare effects, of exploitative conduct is greater during the disaster period. Several other jurisdictions have also signalled increased excessive-pricing risks during the COVID-19 crisis. The European Competition Network, which represents the interests of the European Commission as well as those of national competition authorities within the EU, published a joint statement on competition law during the COVID-19 pandemic in March 2020. This statement mentions specifically that sufficient legal mechanisms exist to prosecute abuses of dominance during the pandemic. Within Europe, several competition authorities have also issued explicit guidance in relation to the prosecution of excessive pricing on selected items during COVID-19: Spain (for funeral services, hydro-alcoholic gels and selected financial services), Greece (healthcare-related products), Romania (sanitary products, protective equipment and disposable gloves) and Italy (selected medical tests). The Competition and Markets Authority of the UK have also signalled increased concerns about excessive pricing in relation to hand sanitiser and selected food items, but have chosen to focus on consumer law as mechanism to prosecute unfair pricing.

As is evident from the overview in this article, the South African jurisdiction has been, by far, the most active in articulating the risks of, and prosecuting, excessive pricing during the disaster period. Beyond South Africa, the prosecution of excessive pricing has been limited to selected jurisdictions in the developing world. In March 2020, the competition authority of Kenya published guidance in relation to excessive pricing during COVID-19 and proceeded to prosecute the excessive pricing of hand sanitiser. Interestingly, the Kenyan authority has also ordered the removal of exclusivity clauses in agreements for the distribution of certain food and medical supplies related to the COVID-19 pandemic. Furthermore, the Turkish competition authority announced significant fines for excessive pricing during the COVID-19 pandemic and initiated investigations against 29 firms in May 2020.

Exploitative conduct, such as excessive pricing, is more probable if firms enjoy greater market power during the disaster period. The economics-based approach to assessing the market power of a firm involves analysing the market in which the firm operates. Within

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[3]   In the US Supreme Court's *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP, 540 U.S. (2003)* case, Justice Scalia held: "The mere possession of monopoly power, and the concomitant charging of monopoly prices, is not only not unlawful; it is an important element of the free-market system. The opportunity to charge monopoly prices – at least for a short period – is what attracts 'business acumen' in the first place; it induces risk taking that produces innovation and economic growth. To safeguard the incentive to innovate, the possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive conduct."

[4]   Article 102 of the Treaty on the Functioning of the European Union (TFEU) prohibits firms with market power from charging excessive prices.

this market, competition practitioners seek to understand the relative size of the firm and the extent of competition (and potential competition). Consequently, the definition of the relevant market (from both a product and geographic perspective) is a critical first step in the assessment of market power. It is therefore vital to assess how the COVID-19 disaster may affect market definition, in order to assess the extent of its expected impact on market power.

The thought experiment that underlies market definition in most competition jurisdictions, including in South Africa, is the hypothetical monopolist (HM) test. The HM test focuses on demand-side substitutability, *i.e.* the substitutes available to buyers of the product or service offered by the firm under investigation. The analyst applying the test must consider when it would be profitable for the firm to impose a "small but significant non-transitory increase in price" (SSNIP), assuming that the firm acts as a hypothetical monopolist (*i.e.* controls an ever-growing set of substitutes for its own product). The smallest possible set of substitutes for which a SSNIP is profitable is considered the relevant market (together with the firm's own product): this set of substitutes significantly constrains the market power of the firm under investigation, as they are the key alternatives available to the customers of this firm.

The COVID-19 disaster can affect how analysts define markets, because of its impact on demand-side substitutability. As discussed later, changes in consumer behaviour during the disaster period – including increased search costs and/or higher valuation of particular product characteristics – may reduce demand-side substitutes and increase the unilateral pricing power of firms – at least in certain types of market (Frank, 2020). This would imply narrower product and/or geographical markets and, hence, increased market power.

From the supply side, limitations on business operations may also delay or prevent entry of new competitors during the disaster period, which would further support arguments that market power may rise during the disaster period. Indeed, competition authorities often view a lack of entry as an important condition for prosecuting excessive pricing (Jenny, 2018): entry may temper excessive pricing in the medium run, limiting enforcement costs (see Ezrachi and Gilo, 2010; Mncube and Ngobese, 2018; Das Nair and Mondliwa, 2017 on how entry and investment considerations played out in seminal excessive-pricing cases in South Africa). The COVID-19 disaster may give rise to significant, though transitory, market power with no prospect of an immediate increase in competition: the short duration of the disaster period may limit the probability of entry.

2.1 A Focus on Shorter Time Horizons

Changes in the behaviour of consumers and competitors during the COVID-19 disaster period may give rise to a *temporary* increase in market power. Conventional competition policy, both in South Africa and abroad, deals with market power as a long-run structural feature: economists view market power as the ability to influence the *long-run* level of mark-ups, *i.e.* the extent to which prices exceed cost in the long run. Market changes resulting in higher long-run mark-ups, rather than transitory price increases, are usually the subject of interest.

A substantial and sudden increase in price does not offer sufficient evidence of market power or its abuse. Even under perfectly competitive conditions, a firm can always increase its price. However, within a short period of time, such a price increase will be met with consumer substitution to other firms, forcing the firm to reduce its price or exit the

market. In the case of a positive, but firm-specific, demand shift, the resultant increase in price will draw heightened competition for customers, ultimately resulting in a demand shift away from the firm to its competitors. Intense competition therefore ensures that firm-specific price increases, and hence margin increases, are transitory. The question, therefore, is whether a substantial or sudden increase in price can be sustained.

Substantial welfare losses obtain when competitive responses to such a firm-specific price increase are muted or slow. Under these circumstances, a firm may be able to implement and maintain an increased price and, hence, margin. Such ability, or market power, is evident from long-run equilibrium behaviour. The typical horizon over which competition economists study price behaviour is 12 months and beyond, as this allows an assessment of the equilibrium relationship between price and its underlying determinants, including rivalry. The hypothetical monopolist test for market definition, in which the analyst considers whether a firm can maintain a small *non-transitory* price increase, therefore typically relies on a period of 12 months or longer (see Bishop and Walker (2002) for an overview). A 12-month or longer horizon is also broadly consistent with the empirical evidence on the speed with which equilibrium between price, demand and cost is established in most markets. For example, South African evidence suggests that the median frequency of price changes for consumer prices is approximately 8 months (Ruch *et al.*, 2016).

The duration of the disaster period may well exceed 12 months. Given the above, under normal circumstances, persistent pricing behaviour – including excessive pricing – would attract policy interest if it was maintained over this period. Yet the COVID-19 regulations seek to do more. The recently completed cases confirm that South African competition authorities focus on particularly short time horizons in assessing pricing conduct during the disaster period. The cases completed so far, discussed later in this paper, indicate a policy concern with price changes in the immediate weeks prior to, or following, the start of the disaster period.

This short horizon may partly reflect, as mentioned, a concern that a firm under investigation may enjoy significantly enhanced market power due to changes in customer behaviour and limits on new entry during the COVID-19 disaster. Yet, as argued further in this paper, policymakers must still distinguish between anti-competitive conduct due to such market power and normal market behaviour – which involves price responding to demand and supply shifts. The assessment of price responses to demand and cost changes is not necessarily quicker or easier during disasters than in other cases. As discussed later, dynamic price adjustment involves partial and lagged responses to demand and cost changes.

Particular care may be required when assessing price behaviour during a disaster period. A sharp increase in price immediately following a disaster is often a response to significant uncertainty about demand and cost conditions.[5] Studies of price gouging following natural disasters suggest that short-run price spikes typically occur in the days immediately following a disaster, after which price returns to levels consistent with cost increases (Wilson, 2014). The uncertainty associated with the disaster period suggests that a short-term horizon must at least account for those initial weeks.

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[5] This is difficult to disentangle from the problem of powerful firms exploiting uncertainty to influence expectations about prices and costs (see Rubinfeld and Steiner, 1983 for an example).

A policy concern with short-term pricing power and conduct bears resemblance to price-gouging laws, which do not necessarily rely on market power considerations. The enforcement of the new excessive-pricing regulations have often been aimed at smaller firms, which would not traditionally be considered dominant (see the final section for a discussion of these cases). The focus on shorter horizons to assess market power has therefore facilitated an expanded scope of South African competition policy during the COVID-19 disaster, especially in relation to excessive pricing. Historically, excessive-pricing enforcement have been limited to highly selective enforcement against large corporates, including Sasol and Mittal, in markets with a particular policy history. This expanded scope, while capitalising on the institutional strengths of our competition authorities, also pushes the excessive-pricing provisions towards a more general price-gouging tool.

As discussed in Section 7, by August 2020, two contested cases, involving excessive pricing during the disaster period, had been concluded in South Africa – in addition to several non-contested cases. One case involved a small wholesaler of facemasks (Babelegi) and another a large pharmacy group (Dischem) for the pricing of its retail mask products. It is useful to briefly note the approach taken by the competition authorities in evaluating temporary market power in these cases, given the arguments presented here.

In both cases, the Competition Commission, as plaintiff, did not engage in a rigorous market definition exercise, but instead argued that market power can be inferred from the conduct itself – effectively, this entails an argument that it is not possible to impose a large price increase if the relevant firm does not enjoy substantial market power. While the Competition Tribunal appears to have accepted this approach in their judgement in the Babelegi case, the Tribunal did engage in a market definition exercise in the later Dischem judgement. Arguably, the latter approach accords with the position advocated in this paper, as it recognises both that the disaster period may affect substitutability and that fact-based analysis is required. As argued earlier, merely observing a firm-specific price increase of a substantial size order does not offer conclusive proof of market power. Furthermore, as explained subsequently, the nature of demand changes during the disaster period (whether they are sustained or involve transitory spikes) are critical to determining the appropriate standard for excessive pricing. In this regard, a rigorous market definition exercise, shedding light on the features of demand, can be useful.

As argued in the introduction, in addition to changes in the assessment of market power, the COVID-19 excessive-pricing regulations raises questions about the relevant standard for excessive pricing. The emphasis on cost-based increases in the new excessive-pricing regulations affects how competition authorities evaluate demand-based price increases. The simulations presented later in this paper show that price-gouging and excessive-pricing benchmarks may differ substantially if demand remains elevated over the disaster period, but may be similar when demand experiences only an initial disaster-period spike.

3. EXCESSIVE-PRICING POLICY IN SOUTH AFRICA

In terms of Section 8(1) of the South African Competition Act (Act 89 of 1998, as amended), a dominant firm is prohibited from charging its customers a price that is excessive. In the original formulation of the Act, an excessive price was to be determined by reference to "economic Value," a concept which was given content in subsequent case law.

The amended Act removes this concept, setting out the factors that should be considered in determining a benchmark competitive price and whether a price is deemed excessive relative to such competitive price.[6] The factors identified in the Act are: (*i*) price-cost margins and other profitability measures; (*ii*) prices charged by the respondent in other markets and over time; (*iii*) prices and profits of comparator firms in competitive markets; (*iv*) duration of pricing at that level; (*v*) structural characteristics of the relevant market, including market share, contestability, barriers to entry and past or current advantage that is not due to the respondent's own commercial efficiency or investment; and (*vi*) any regulations made by the Minister of Trade, Industry and Competition, "regarding the calculation and determination of an excessive price."

Following the declaration of a national disaster due to COVID-19, the Minister relied on Section 8(3)(f) to introduce new regulations on determining excessive pricing, in selected industries, during the period of national disaster. These regulations define an excessive price increase as a price increase that (*i*) does not correspond to increases in costs or (*ii*) results in an increased markup relative to the average markup achieved over the three-month period from December 2019 to February 2020. The regulations apply to four broad groups of goods and services: (*i*) basic food and consumer items; (*ii*) emergency products and services; (*iii*) medical and hygiene supplies; and (*iv*) emergency clean-up products and services. These regulations, which pertain to competition policy, are the focus of this paper. Even so, the regulations were accompanied by regulations, similar in form, pertaining to the South African Consumer Protection Act (Act 68 of 2000, amended). This Act contains provisions against "unconscionable, unfair, unreasonable and unjust" prices. The regulations rely on Section 120(1)(d) to define, for the period of national disaster, price increases as unfair if the price increase meets the same conditions as those for excessive pricing: it does not correspond to increase in cost or results in an increased markup when compared to the 3-month period prior to the disaster period. In contrast to the broad groups defined for excessive pricing, these regulations apply to a specified set of household products and medical services.

Subsequently, the Minister tasked the South African competition authorities to implement both the competition-law and the consumer-law regulations. This is arguably a pragmatic decision to capitalise on the institutional strengths of the competition authorities. Even so, the benchmark triggering competition-law investigations of excessive pricing differs from the benchmark triggering investigations of price gouging, which is the focus of the consumer-law-based regulations mentioned above. This distinction receives further attention in the subsequent sections.

4. COMPETITIVE BENCHMARK PRICES

The principal economics concern in excessive-pricing cases is the determination of the competitive benchmark price. Competition policy allows for imperfect competition,

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[6] The legal consequences of these changes are yet to be established. From an economics perspective, however, it is useful to note that the factors now explicitly mentioned in the Act are similar to the factors considered by case law to give content to the concept of "economic value." Even so, removing the reference to "economic value" does not solve the problem of obtaining a competitive benchmark price.

implying that a perfectly competitive price does not offer an appropriate benchmark. While allowing imperfect competition to affect pricing, competition policy against excessive pricing does not permit monopoly pricing. Excessive-pricing provisions are specifically aimed at preventing firms from fully exploiting consumers' willingness to pay prices that would not prevail in a more competitive market. Indeed, the challenge of determining an appropriate competitive benchmark is a key reason for the circumscribed application of excessive-pricing provisions (Drexl, 2011:323).

International competition policy practice features two approaches to obtaining competitive benchmark prices in excessive-pricing cases (Gilo, 2018). Comparative benchmarking involves comparison of the market price under investigation with prices set by the firm under investigation, or similar firms, in other markets (Gilo and Spiegel, 2018). To the extent that demand and supply conditions are similar to the market under investigation, so that the markets are broadly comparable but for the difference in competitive conditions, the latter would offer competitive benchmarks for the market under investigation. If this condition is met, significant price differences can be attributed to differences in competition. Specifically, if prices are significantly higher in the market under investigation, it may be considered evidence of excessive pricing.

An alternative approach entails cost-based benchmarking, which involves assessing a firm's cost structure – to determine average cost for the product under investigation – and identifying an appropriate profit margin. As discussed below, South Africa has been a front-runner in developing this approach, with several well-known cases featuring sophisticated cost-benchmarking exercises.

While comparative and cost-based benchmarks offer complementary approaches to obtaining competitive reference prices, a cost-based approach faces significant practical challenge. First, the determination of a firm's cost structure requires a bottom-up approach, including translating accounting costs into economic costs and allocating such costs to the product under investigation. Misallocation, including of common costs, may upwardly bias the estimated competitive price. Second, a cost-based approach faces the task of determining the profit margin that would apply if the market was "competitive."

There are conditions under which a cost-based approach may be preferable, notably in the absence of comparator markets or firms. Apart from these select cases, comparator approaches may well be preferable. Comparator approaches can provide a range of price estimates, allowing practitioners to infer an *upper bound* for the competitive price (Gilo, 2018). Besides, realised price exceeding this upper bound is a sufficient condition for its also exceeding a cost-based benchmark.

It is useful to distinguish between comparator benchmarks based on spatial or rival comparisons and those based on intertemporal comparisons.[7] Spatial comparisons involve as reference prices those charged by the same or other firms in more competitive markets or to other classes of consumer in the market. Similarly, rival comparisons rely on prices charged by direct rivals of the firm in the market under investigation. Intertemporal comparisons – the focus of this paper and of the new regulations – involve a comparison of price in the period under investigation against prices charged in a different period. Intertemporal approaches can involve either before-and-during analysis, in which a

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[7]   See Boshoff (2015) for a related taxonomy of benchmarks for cartel-damage estimation, with a South African application.

preceding period is used as the reference competitive period, or a during-and-after analysis, which relies on a subsequent period.

Intertemporal comparisons are preferable to spatial comparisons when seeking to identify benchmark competitive prices. It is often challenging to account for idiosyncratic features of demand, supply or structure in other markets and many of these features may be unobservable. This undermines the general utility of spatial comparisons in excessive-pricing investigations. Price comparisons based on the same, rather than a different, market may largely avoid this problem (Akman and Garrod, 2011). Where the same market can be observed, under periods with different competitive dynamics, price differences between the periods can be related to competitive differences with relatively high confidence. Consequently, where data availability permits,[8] the preferred benchmark in excessive-pricing investigations should be the market *under investigation* over an earlier or subsequent time period.

During the disaster period, rival price comparisons may be even less useful, especially if rivals have also increased prices during this time (when prices are strategic complements). Similarly, spatial price comparisons may ignore that prices may have increased in other geographic locations because of similar increases in market power. Preliminary indications from other jurisdictions suggest cases clustering in the same type of product market (*e.g.* face masks). Therefore, for cases involving markets of a considerable geographic scope, international price comparisons, for examples, may be problematic. Where the disaster period does not raise such additional concerns (perhaps in cases featuring local geographic markets, which allow price comparisons with, for example, nearby markets), intertemporal comparisons continue to offer more appropriate benchmarks for COVID-19-related investigations, for the reason discussed above.

4.1 Requirements for the Application of Intertemporal Benchmarks

The utility of an intertemporal benchmark vitally depends on the presence of an exogenous structural shift that results in significantly different competitive conditions in the period under investigation compared to the benchmark period. Gilo (2018) identifies three such structural shifts for excessive pricing benchmarking. First, the entry of new competitors can materially affect ex post competitive conditions. Competition authorities can prove ex ante excessive pricing by comparing pre- and post-entry prices in the market. Second, changes in regulation (specifically, deregulation) or related marketing strategies can affect competitive behaviour. Especially in markets with some form of price regulation, which can be taken as attempts to establish more competitive prices, the regulated period may be an appropriate benchmark period. For example, recent excessive pricing cases in pharmaceutical markets relate to price increases following changes in branding in order to avoid regulation (see the recent *Flynn Pharma Limited and Pfizer Limited v The Competition and Markets Authority (2020)* case in the UK Court of Appeal). Third, changes in consumer behaviour can affect competition and pricing. Gilo (2018) notes an example related to consumer boycotts of cottage cheese in Israel, where higher price elasticity during the boycott period resulted in significantly lower prices.

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[8] Price comparisons may not be possible in the case of investigations where ex ante data is limited or too far back in the past – see Boshoff (2015) for a South African cartel study related to this problem.

Anti-cartel policy also relies on structural shifts related to competition when identifying the price overcharge of cartels. Cartel overcharge models compare prices during collusion with prices prior to or following collusion and depend critically on the presence of structural changes associated with the end (or onset) of cartels. Such changes may include cartel enforcement or the entry of new competitors.[9]

The structural shifts on which intertemporal benchmarking relies must be clearly linked to changes in competitive conditions. The COVID-19 regulations suggest that the national disaster is considered a structural shift that delineates a more competitive pre-disaster and less competitive disaster period, allowing identification of price changes with changes in competition. However, we note below that this shift is difficult to disentangle from demand and cost changes during this period.

A further condition for intertemporal benchmarking, to provide comparable reference prices, is that the benchmark period must involve transactions under similar demand and cost conditions to those of transactions in the period under investigation (Akman and Garrod, 2011:413). Consequently, one should distinguish between unconditional (which do not correct for the impact of demand or cost changes on price) and conditional comparisons. To the extent that demand and cost conditions are broadly similar, the former may be sufficient. In most cases, however, conditional comparisons are required.

A conditional intertemporal benchmark price is a constructed, or counterfactual, price. It refers to the price that would have been charged if the benchmark period was characterised by the same demand or cost conditions prevalent in the period under investigation. The competition-economics literature has built up a significant body of work around the estimation of conditional intertemporal benchmarks relying on statistical analysis, to which we return later in this paper. The conditionality requirement represent a significant challenge when relying on intertemporal benchmarking in a market that is subject to significant demand or cost shocks. If the benchmark period does not contain periods during which prices have had to respond to large demand shocks or to significant increases in cost or cost uncertainty, it may be challenging to obtain comparable conditional prices. As discussed below, this should be considered at the core of the challenge facing economic analysis in COVID-19 excessive-pricing investigations.

5. COMPETITIVE BENCHMARK PRICES UNDER COVID-19

South African competition policy has been a leader in the prosecution of excessive pricing. A number of high-profile cases – including cases involving Mittal-Harmony[10] and Sasol – raised important questions about the appropriate competitive benchmark. Das Nair and Mondliwa (2017) and Mncube and Ngobese (2018) offer a comprehensive summary of these early cases and the accompanying standards, while Murgatroyd *et al.* (2017) present a comparative overview within the BRICS context. As is clear from this literature and case law, practitioners have avoided relying on intertemporal comparisons

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[9]   In South Africa, a number of cartels were uncovered in the mid- and later-2000s after innovations in competition policy, such as corporate leniency.
[10]   see the South African Competition Appeal Court's judgement in Mittal Steel South Africa Ltd. & Others v. Harmony Gold Mining Co. Ltd. & Another 2009 ZACAC 1 (70/CAC/Apr07) 40 (S. Afr.).

in the seminal excessive-pricing cases in South Africa, preferring cost-based benchmarks. Roberts (2008), Das Nair (2008) and Calcagno and Walker (2010) provide in-depth analyses of cost-based benchmarks in the seminal Mittal-Harmony case, highlighting the variety of challenges associated with cost and profit measurement.

In the earlier cases, intertemporal comparisons would have been less useful, due to the unique competition problems associated with these cases, which involved the exploitation of market power over many years, with no discernible competitive period (*e.g.* see Mondliwa and Roberts (2019) on the Sasol case and the role of state support). Indeed, most comparator-based methods would have faced challenges in these cases, given that underlying demand conditions may not be similar in different markets (see Murgatroyd and Baker (2011)).

The COVID-19 regulations require the assessment of excessive pricing during the national disaster period to rely on an intertemporal comparison of prices. As noted earlier, the regulations consist of two parts and breaching either part is sufficient to trigger prosecution. The first part of the regulations emphasise that price increases that do not correspond to cost increases will be considered excessive. An economics interpretation of this provision is that the correlation between price and cost during the disaster period must be unchanged relative to that of a prior benchmark period. Retrospective analysis is essential, especially given that price may respond differently to different cost items and given the dynamic nature of price adjustment. The second part of the regulations emphasise that profit margins must be constant between the disaster period and a 3-month period preceding the disaster period, which would also imply an intertemporal benchmark approach.

As discussed previously, an intertemporal benchmark for excessive pricing during the disaster period must meet two conditions. First, the disaster period must be associated with a structural shift that can be linked to changes in competitive conditions. Second, the comparison must control sufficiently for demand and supply conditions to ensure that transactions between the two periods are comparable.

5.1 Structural Shift Associated with COVID-19

Crisis conditions can imbue smaller firms with market power (as is evident in the prosecution of smaller retailers during the disaster period) and enhance the market power enjoyed by larger firm or provide incentives for currently powerful firms to raise prices.

One may advance two hypotheses concerning the impact of the COVID-19 disaster on consumer behaviour. The first hypothesis is that the disaster period may significantly raise transaction costs, including search costs, for buyers of retail goods and services, which will reduce the set of substitutes that constrain the market power of firms. In particular, transaction costs may be higher (relative to the pre-disaster period) for at least two reasons. First, lockdown and other restrictions on movement during the disaster period may reduce the mobility of customers and their associated ability and willingness to respond to price increases. Second, and related, health concerns may reduce willingness to enter alternative outlets in search of substitute products. Consequently, market definitions are likely to be narrower.

The second hypothesis is that the disaster period may significantly alter consumers' valuation of product characteristics for selected products, reducing or otherwise limiting the set of substitutes that would constrain the market power of firms selling those

products. For example, whereas hand sanitisers with lower alcohol content may have been substitutable with other soaps or sanitisers, they may now be significant less substitutable. Consequently, market definitions are likely to be narrower.

These hypotheses are likely of greater import in retail markets, which would that the retrospective benchmark implied by the regulations may well be easier to sustain in the context of cases against retailers. Even so, the empirical support for these hypotheses will have to be considered on a case-by-case basis, as part of the market definition exercise. For example, the increase in transaction costs may be weaker in high-income retail settings. Firms offering online substitutes for the products of bricks-and-mortar retailers have rapidly expanded in a few weeks during the lockdown period, which undermines the argument that retailers of food and other essentials would gain much local power. The hypothesis may enjoy stronger support in low-income settings where consumers do not have online alternatives.

In upstream wholesale and input markets, the first hypothesis may enjoy less support. Search costs may be less significant in markets involving business-to-business transactions, where a significant portion of which may be governed by long-term contracts and involve negotiation with powerful buyers. In any event, many South African wholesale markets for food products do include a large number of smaller buyers, which already suggest market power for sellers. In contrast, the second hypothesis would imply changes in the inputs purchased by retailers, and may be supported in markets where upstream suppliers and manufacturers face weaker competition from competing suppliers due to supply disruption during the disaster period, especially in those markets where international suppliers compete.

Apart from changes in consumer behaviour, competition authorities may also rely on the impact on the impact of the regulations on the extent to and speed with which firms not currently active in the defined market may enter. In this regard, one hypothesis concerning the impact of the COVID-19 disaster would involve that, in those industries facing fixed costs, the relatively short duration of the disaster period would limit entry and, hence, supply side substitutability. A lack of entry is a core consideration in excessive pricing investigations: competition practitioners are often willing to limit enforcement to high profile cases if, in the long run, entry is considered unlikely or ineffective. The very nature of the COVID-19 disaster may limit the potential of new competitors to enter.

Even so, it would appear that there is no necessary link between the regulations and changes in competitive conditions. Such a link may well be likely in particular retail settings, which would support the focus of the initial enforcement efforts on retailers.

5.2 Controlling for Demand Under COVID-19

Apart from relying on a structural shift impacting competitive conditions, intertemporal benchmarking requires similar demand and cost conditions to hold during the two periods, *i.e.* before and after the structural shift. As argued, markets may well be characterised by changes in demand and supply, making *conditional* comparisons essential.

The first part of the new regulations require price comparisons between the periods to be conditional on cost changes. The second part of the regulations (which require profit margins to remain constant) also imply this conditionality: formally, the second part may be interpreted as defining a price increase as excessive if:

$$\pi_t > \pi_{t-1} + \epsilon$$

with π_t the profit margin at time t. ϵ is a parameter to reflect the burden of proof, which eliminates the prosecution of profit differences of an appropriately small degree. Frank (2020) argues for a safe harbour if the gap between price and cost does not exceed 20%, consistent with South African competition authorities' reliance on a 20% harbour on the basis of "economic value" in previous cases. As noted earlier, the amended Act has removed reference to economic value.

The above profit condition can be decomposed in its price and cost components as follows:

$$P_t - C_t > P_{t-1} - C_{t-1} + \epsilon$$

Re-arranged, the condition can be stated as:

$$P_t - P_{t-1} > C_t - C_{t-1} + \epsilon$$

Consequently, the second part of the regulations permits increases in price, relative to the price prevailing during the pre-disaster period, if the price increase is consistent with an increase in cost.

Intertemporal price comparisons that are conditional on cost must be sensitive to changes in the cost structure of firms during the disaster period. The disaster period may bring novel cost pressures from various sources. First, interruptions to supply chains can constrain production or sales and increase costs. For example, disruptions may arise in the distribution network (due to constraints at maritime ports and airports), upstream production or a reduction in available labour (including due to constraint in operating hours and new health regulations). Second, search costs may increase significantly, if supply disruptions require firms to identify new suppliers and negotiate prices. For example, in the absence of favourable contract-based terms with existing suppliers, a firm may need to pay spot prices. Suppliers may also invoke force majeure clauses, allowing the pass-on of higher costs to buyers. Third, surges in demand may create capacity constraints, which may cause firms to incur additional costs. Finally, firms may be required to incur additional costs related to hygiene and sanitisation.

While a sensitivity to higher or additional costs may appear consistent with the new regulations, it is not immediately clear how demand-based price increases are to be treated. The regulations make no explicit reference to demand conditions. By focusing exclusively on cost-based price increases, the regulations identify as anti-competitive any price response to a demand-side factor during the disaster period. This approach effectively transforms excessive-pricing regulations into price-gouging regulations, which typically treat any demand-based price increase as "unfair." Indeed, the consumer protection sections in the disaster-period regulations rely, similarly, on exclusive cost-based criteria to determine "unconscionable, unfair, unreasonable and unjust" prices: the excessive-pricing provisions are therefore similar to consumer-protection provisions (with the latter focused on a somewhat broader set of products and not requiring a finding of dominance).

An exclusive cost-based focus is contrary to the objective of relying on retrospective prices to provide reference prices that can be considered *competitive*. Indeed, Motta and de Streel (2007) note explicitly that a competitive price "is not only determined by supply-side factors (in particular the cost of production), but also by demand side factors (demand elasticity, willingness and ability to pay)." Demand shifts in consumer income,

prices of substitute products and demand seasonality may affect prices, even in competitive settings. Expected normal demand features as a statistically significant factor in empirical models of price (see seminal work on manufacturing industries by Maccini (1978)).

Competition policy practice recognises that obtaining a comparable competitive price from the benchmark period requires accounting for both cost and demand differences between the periods (Gilo, 2018). International practice suggest that even cost-based benchmarks for excessive pricing must at least account for demand factors. For example, in its *Port of Helsingborg* decision, the European Commission explicitly considered aspects of port customers' willingness to pay in applying cost-based tests. In a prominent *Attheraces* appeals case in the United Kingdom, excessive-pricing findings were overturned based on failure on the part of the authorities to account for customer valuation when assessing excessive pricing. Indeed, Motta and de Streel (2007) use the requirement to at least account for demand as one reason for relying on multiple excessive-pricing tests.

To the extent that South African policymakers have chosen to rely on competition policy to address pricing behaviour during the national disaster period, it follows that such policy must be sensitive to demand-based price increases as indicative of normal competitive behaviour. Previous excessive pricing cases in South Africa have attempted to grapple with the impact of demand: in the Mittal case, cost and profit comparisons accounted for global steel demand conditions. However, these cases did not involve controlling for demand in the context of intertemporal benchmarking. An intertemporal benchmarking approach sensitive to demand would be consistent with South African policy approaches to damage determination in cartel cases – indeed, the proposed econometric approach in Section 6 draws heavily on damages models which typically control for *both* demand and supply factors when estimating the price overcharge of a cartel. For example, Boshoff and Van Jaarsveld (2019), when estimating overcharges by the cement cartel, control for the impact of construction demand, including the World Cup construction boom.

Therefore, an alternative interpretation of the new regulations would be that they may be concerned with prohibiting price changes due to exogenous changes in demand or supply, rather than adopting a narrow focus on the effects of market power and its abuse during the disaster period. A narrow focus does not imply that competition policy allows rational monopolists, or firms otherwise enjoying market power, to set prices at levels that fully exploit their customers' willingness to pay. The case law recognises that such a benchmark would impair the enforcement of excessive-pricing policy, as monopoly pricing is its primary concern (Gilo, 2018). Even so, international legal practice affirms the need to account for demand-side factors when evaluating excessive pricing: even after the competition authority has decided to enforce an excessive-pricing prohibition on a dominant firm, the recent Flynn Pharma/Pfizer case in the United Kingdom confirms that a respondent must be given an opportunity to show that the price it charges is justified, at least partly in relation to the consumer benefit of the product.[11]

An intertemporal benchmark overcomes the difficult problem of accounting for demand shifts and consumer benefit, while disallowing full exploitation of willingness-to-pay.

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[11]   See also the earlier *Scandlines Sverige AB v Port of Helsingborg (23 July 2004)* EU case where the European Commission has taken particular account of demand-side factors in analysing competitive benchmark prices.

Intertemporal comparisons allow for price changes due to changes in demand-shift variables between the period under investigation and the benchmark period, but not for price changes due to structural changes in demand (which are the sources of market power, as discussed earlier). This advantage of the intertemporal benchmark is even more important in the context of COVID-19 cases, where changes in the willingness-to-pay is at the heart of excessive-pricing investigations: as argued earlier, changes in the willingness-to-pay underlies increased market power and its potential abuse during the disaster period.

A consideration of the influence of demand shifts on price may also be important to an assessment of cost. "Demand"-related variables, such as measures of unfilled orders and of finished-goods inventories, may be significant drivers of price, either because they shift demand or, importantly, affect the cost function of firms. The effects differ depending on the type of production in which the firm is involved. Firms that produce to stock are primarily concerned with goods inventories, maintaining a particular level of stock (say, at retail outlets) depending on anticipated demand. Firms involved in production to order are concerned with responding to demand, keeping delivery lags minimal. In production-to-order, a large order backlog – due to a surge in demand – may permit production smoothing (and lower costs), while larger inventories increase holding costs (including storage and insurance costs) in production-to-stock markets. Case-by-case assessment of the mode of production is therefore required.

Treating demand-based price increases during the disaster period as necessarily anti-competitive undermines the consistency introduced by retrospective benchmarking: it is not clear why price-cost relationships in the past should be considered an appropriate guide for the present, while price-demand relationships are not. Subsequent sections in this paper explore and contrast such a price-gouging view against the standard excessive-pricing view. We show that there are conditions where economists may discount demand-based price spikes, as long as average prices over a sufficient period is considered.

5.3 Duration of Benchmark Period Under COVID-19

The excessive-pricing regulations in South Africa also specify the period (December 2019 to February 2020) applicable in determining the intertemporal benchmark. The literature on intertemporal benchmarks refrains from linking such benchmarks to particular time frames. A benchmark price is the average price over a competitive period of suitable duration, where such duration should reflect a balance between obtaining a thorough assessment of price setting and minimising the risk of structural or other factors contaminating the assessment. As far as the former requirement is concerned, an interval of sufficient duration is required in order to assess the dynamic nature of price, cost and demand as well as their respective relationships.[12]

From the perspective of the latter requirement for structural stability, an interval of sufficiently short duration is required to ensure that market conditions approximate those prevailing during the period under investigation. The trade-off between a choice

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[12] The end of the pre-disaster period may also be characterised by price adjustment in anticipation of the change in competitive conditions, as well as changes in demand and supply, associated with the disaster period. Price adjustment, and its implications for the dating of anti-competitive effects, have been the subject of significant interest, especially in the cartel damage literature – see Boswijk *et al.* (2019) and Boshoff and Van Jaarsveld (2019).

of duration that enables a complete assessment and one that limits structural changes is heavily dependent on the frequency of price changes and the availability of data. Low-frequency price changes (quarterly and lower) would imply that an interval of a longer duration is required, while the availability of data may also result in a duration less than the ideal. Even where price changes are of a higher frequency, it may be necessary to look further back before the December-February period, when historically subdued demand and cost increases, seasonal fluctuations or other idiosyncratic price behaviour (including special discounts) characterise the market. A short reference period may be particularly problematic in retail setting relying on promotional pricing, where a return to normal pricing coinciding with the disaster period may lead to incorrect inferences of unjustifiable price increases.

Furthermore, in relation to demand spikes, it may be particularly important to consider past responses to periods of unexpected and large demand (or cost) shocks. Consequently, a three-month period is not necessarily appropriate for the estimation of underlying elasticities, even for prices set at a relatively high frequency. This is true whether or not actual econometric analysis is employed: even in those instances where authorities rely on a qualitative analysis of price elasticity, it is preferable to draw on the experience over a longer period to infer average behaviour. As shown in the case overview presented later in this paper, it is not clear to what extent competition authorities have limited their analysis to the three-month horizon.

6. ECONOMETRIC BENCHMARK ESTIMATION

The COVID-19 regulations require a conditional intertemporal benchmark, which involves a comparison of prices during the period under investigation (disaster period) with those of a benchmark period (pre-disaster period), after controlling for both demand and cost differences between the periods. The literature on cartel damages offers an econometric methodology for obtaining benchmark prices, using reduced-form regression. The following sections discuss this econometric methodology, as applied to conventional excessive-pricing and (for a comparative view) price-gouging investigations. As shown, the distinction between conventional excessive-pricing and price-gouging benchmarks matters for COVID-19 excessive-pricing investigations.

6.1 Econometric Model for Benchmarking in Excessive-Pricing Cases
Intertemporal benchmarking requires conditional comparison of prices in the benchmark period (which we have argued is considered more competitive) relative to those in the period under investigation (which, due to a structural shift, is now less competitive). In the context of COVID-19, conditional comparisons would be between the disaster period (the period under investigation) and the ex ante period (the competitive benchmark period). Conditional comparisons discount price differences that are due to cost and demand differences.

Econometric modelling can assist in discounting demand and cost differences. Benchmarking requires a study of reduced-form price elasticities, with respect to both demand and cost, during the benchmark period (Nieberding, 2006; Rubinfeld, 2008). These elasticities, applied to demand and cost factors during the period under investigation, allows a forecast of the price that the firm would have charged if it had still faced

the pre-disaster competitive conditions. The cartel damages literature has long relied on such econometric modelling to achieve benchmarking (Rubinfeld, 2012). Price over-charge during collusion is the basis of cartel damages and is typically determined by comparing prices during the cartel period with prices during a more competitive period, preceding or following the cartel period. Intertemporal benchmarking in excessive pricing investigations face a similar problem to determine the 'overcharge' relative to the price in a competitive period. As explained below, the cartel-damages literature offers a reduced-form econometric methodology for estimating competitive benchmark prices in excessive-pricing investigations.

Practical considerations may prevent the explicit use of econometric analysis, especially in the context of excessive pricing investigations under the new regulations (with their truncated adjudication periods). But even where econometric modelling is not possible, the exposition in this section elucidates key empirical issues in the assessment of excessive pricing. The econometric methodology provides a guide for an empirical strategy based on qualitative analysis or more rudimentary quantitative techniques. Even if econometric analysis is feasible, it may be preferable to rely on multiple approaches in order to triangulate estimates.[13]

Econometric analysis allows an assessment of the dynamic relationships between cost, demand and price. Menu costs (including the cost of re-negotiating prices or changing list prices) may lead firms to limit the response of price to small cost changes and gradually increase prices over time. Prices may also increase at different time points for different customers, depending on contractual arrangements. Similarly, prices may not respond to short-term demand or cost fluctuations immediately, as firms seek to smooth production over time to avoid costs related to varying production. Dynamic econometric models capture these effects. Furthermore, incorporating lagged price terms in dynamic models also allows controlling for the influence of non-observable information. For these reasons, the cartel-damages literature relies on dynamic price regressions (for a recent summary, see Boswijk *et al.* (2019), for South African applications see Govinda *et al.* (2016), Mncube (2014) and Boshoff (2015)).

Consider a reduced-form model of price during the pre-disaster period ($t = 1, \ldots, T_1$, with T_1 the end of the period):

$$P_t = \alpha_0 + \alpha_1 P_{t-1} + \alpha_2 D_t + \alpha_3 D_{t-1} + \alpha_4 C_t + \alpha_5 C_{t-1} + \varepsilon_t \tag{1}$$

where P is the price of the product, D is a demand shifter and C is a cost shifter, with $\varepsilon_t \sim \mathcal{N}(0, \sigma^2)$. The autoregressive distributed lag (ARDL) specification reflects the dynamic adjustment of price, cost and demand, allowing for both contemporaneous and lagged price adjustment.

Intertemporal benchmarking relies on the parameter estimates from (1) to obtain dynamic price forecasts $\hat{P}_t$ during the disaster period ($t = T_1 + 1, \ldots, T_2$):

$$\hat{P}_t = \hat{\alpha}_0 + \hat{\alpha}_1 \hat{P}_{t-1} + \hat{\alpha}_2 D_t + \hat{\alpha}_3 D_{t-1} + \hat{\alpha}_4 C_t + \hat{\alpha}_5 C_{t-1} \tag{2}$$

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[13] See Boshoff (2011) for a defence of limited-information quantitative tools in competition analysis, with applications to South African competition policy.

These forecasts constitute the competitive benchmark prices, applicable to the disaster period. Under this approach, price is excessive to the extent that it deviates from the benchmark level suggested by demand and cost factors.[14] Applied to the COVID-19 disaster, the assumption is that the deviation of the actual and benchmark price during the disaster period is a reflection of a change in competitive conditions due to the crisis, the sources of which must be verified (and relate to changes in consumer behaviour and lower likelihood of new entry).

6.2 Econometric Model for Benchmarking in Price-Gouging Cases

Conventional excessive-pricing investigations focus on pricing due to a lack of competition after controlling for non-competition factors – specifically, demand and cost factors. In contrast, price-gouging cases emphasise price responses to demand as undesirable. As noted earlier, price gouging laws differ across a variety of jurisdictions (including within the United States), but the overarching aim is to keep prices as close to their pre-disaster behaviour as possible. At the same time, it is often accepted that prices may vary for cost-related reasons. Research following Hurricane Katrina in the United States reject a hypothesis of price gouging, with the evidence indicating that cost explains most of the price increases following the disaster, at least if one excludes the first days immediately following the disaster (see Montgomery *et al.*, 2007; Wilson, 2014). A version tolerant of market forces would also allow for a price response to "normal" demand. Therefore, a generous benchmark price for the purposes of assessing price gouging would reflect cost as well as "normal" demand, *i.e.* demand neutral to a disaster-period surge.

Price-gouging counterfactual prices ($\hat{P}^*$), neutral to a demand surge during the disaster period ($t = T_1 + 1, \ldots, T_2$), would be:

$$\hat{P}_t^* = \hat{\alpha}_0 + \hat{\alpha}_1 \hat{P}_{t-1}^* + \hat{\alpha}_2 \hat{D}_t + \hat{\alpha}_3 \hat{D}_{t-1} + \hat{\alpha}_4 C_t + \hat{\alpha}_5 C_{t-1} \tag{3}$$

where $\hat{D}_t$ is a forecast of the demand-shift variable, based on pre-disaster behaviour.

As demonstrated by the following simulation example, the nature of the disaster-period demand surge will determine the extent to which a price-gouging benchmark in (3) differs from an excessive-pricing benchmark in (2).

6.3 Impact of Demand Spikes and Elevated Demand on Benchmark Differences

Price-gouging laws are primarily aimed at muting price responses in the immediate run-up to and aftermath of a natural disaster. Demand spikes, due to panic buying, often put extreme pressure on prices. Some of the initial cases investigated under the new regulations in South Africa reflect such a spike in demand. These include retail cases involving

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[14]   An alternative approach involves estimating equation (1) over *both* the pre-disaster and disaster period, but adding a disaster-period dummy variable as well as a set of variables capturing interactions between the dummy variable and the various demand and supply terms. The sum of the coefficients on these additional variables then measure the extent to which price deviates from the predicted pre-disaster level. There is an extensive literature on the conditions for equivalence between forecasting and dummy-variable approaches, with the latter potentially improving forecast accuracy by increasing sample size, but the former allowing a more flexible treatment of parameter constancy (see, for example, McCrary and Rubinfeld, 2014). Boshoff and Van Jaarsveld (2020) discuss the impact of time-series properties on the equivalence of the two approaches.

panic purchases of hand sanitiser and, for the smaller retailer cases, masks at the start of the lockdown period. Yet not all disaster-period demand changes take this particular form. A number of cases involve consistently elevated demand, including demand for masks from manufacturers and larger retailers.

A distinction between cases involving demand spikes and cases involving persistently elevated demand matter for the determination of average benchmark prices. The primary aim of the forecasts in (2) and (3) is to estimate an average price. Average prices, calculated over a sufficiently long period, reflect long-run equilibrium prices. As argued earlier in this paper, long-run equilibrium prices are the traditional focus of competition policy. Short-run fluctuations are important in relation to how they contribute to the maintenance of long-run equilibrium. For example, Nieberding (2006) studies how a short-run model, specifically a reduced-form error-correction model of price, can yield insight into the long-run effect of anti-competitive behaviour.

In the absence of trending behaviour in prices, as exhibited in the example below, dummy-variable methods are often used as a substitute for forecasting methods. These dummy-variable methods yield an estimate of the average price increase for the period under investigation, rather than price forecasts for each date in the period. In the presence of trending behaviour, where dummy-variable methods are less useful, one can infer an average price increase based on the individual date forecasts. A disaster-period demand spike may produce a short-term price increase that does not change the excessive-pricing benchmark significantly, resulting in a benchmark quite similar to that of price-gouging. In contrast, elevated demand may well raise the average benchmark prices obtained from (2), resulting in a significant difference between the price-gouging and excessive-pricing benchmarks.

Consider a model based on (1), with the following parameterisation for the pre-disaster period $t = 1, \ldots, 50$:

$$P_t = \alpha_0 + 0.6P_{t-1} + 0.4D_t + 0.4D_{t-1} + 0.5C_t + 0.3C_{t-1} + \varepsilon_t \tag{4}$$

where cost evolves as follows:

$$C_t = 0.4 + C_{t-1} + \varepsilon_{C,t} \tag{5}$$

and demand as follows:

$$D_t = 0.4 + t + \varepsilon_{D,t} \tag{6}$$

The chosen parameterisation ensures trending behaviour in both costs and demand, with (6) ensuring that demand shocks are not permanent – an important feature for the subsequent simulation exercise.

Suppose that cost remains unchanged.[15] Consider two possible demand processes for the disaster period. First, suppose that the disaster period, $t = 51, \ldots, 80$, is characterised by a demand shock of size 10 at the start and demand subsequently returns to its pre-disaster trajectory:

$$D_t^{spike} = 0.4 + t + \varepsilon_{D,t} + \varepsilon_{D^{spike},t} \tag{7}$$

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[15]   This is not key to the result, but ensures that disaster-period price behaviour can be linked to demand in the particular simulation exercise presented in this paper.
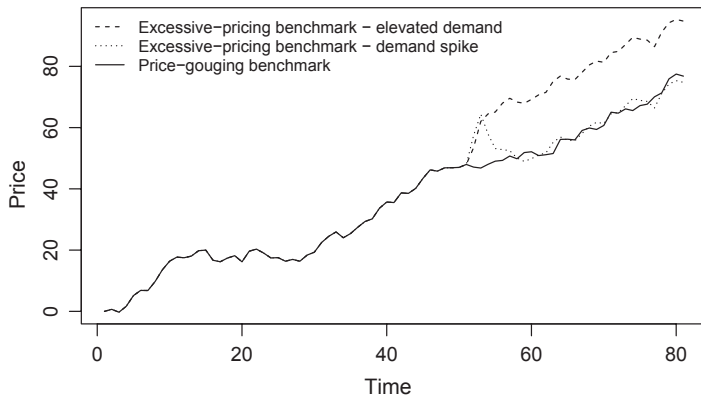
Figure 1. Excessive-pricing and price-gouging benchmarks

with $\varepsilon_{D^{spike},t} = 10$ at time $t = 51$ and $E(\varepsilon_{D^{spike},t} = 0)$ for $t = 52, \dots, 80$.

Second, suppose that demand is elevated, by size 10, for the duration of the disaster period:

$$D_t^{elevated} = 0.4 + \gamma_t + t + \varepsilon_{D,t} \tag{8}$$

with $\gamma_t = 10$ for $t = 51, \dots, 80$

Fig. 1 shows prices during the pre-disaster period together with a set of benchmark prices for the disaster period. This figure does not include any realised price for the disaster period, in order to focus attention on the various benchmarks. In particular, Fig. 1 shows the benchmark price under a price-gouging law ($\hat{P}^*$, based on equation (5)). As discussed earlier, while this particular price-gouging benchmark makes no allowance for abnormal demand during the disaster period, it does reflect price-responses to the normal trajectory of demand. Given that we have not allowed for cost increases in this simulation, this benchmark behaves similar to the pre-disaster price. Furthermore, Fig. 1 shows two excessive-pricing benchmarks ($\hat{P}$, based on equation (2)), when disaster-period demand follows the spike defined by (6) and when it is elevated for the entire period, as defined by (7).

The excessive-pricing and price-gouging benchmarks are similar in the case of a disaster-period demand spike: given a period of sufficient duration, average price increases predicted by the two benchmarks are similar. The benchmarks differ substantially when demand is persistently elevated over the disaster period. In these cases, excessive pricing sets a more lenient benchmark, to allow the demand shift to be reflected in prices.

Without a sufficient period to account for the dynamic behaviour of price, a transitory price response to a demand spike would be easily confused with a price response to elevated demand. Even for a transitory shock limited to period 51, the lagged response of price generates increases until period 52 and elevated levels (relative to the price-gouging benchmark) for several periods afterwards. Because of this dynamic behaviour, and the impact of idiosyncratic demand and supply shocks in any one period, interval forecasts – which involves average forecasts over a particular horizon – are superior to point forecasts.
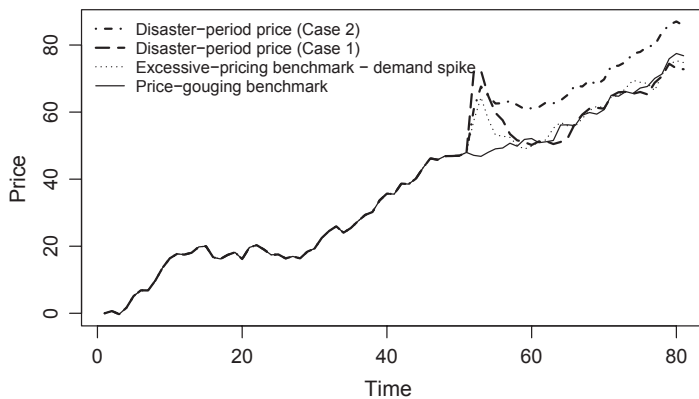
Figure 2. Demand spikes and excessing pricing

The duration of such an interval is an empirical matter based on an understanding of price-demand dynamics in the case at hand.

Fig. 2 elucidates this point, focusing exclusively on a demand spike at the start of the disaster period. The graph shows two realised price series over the disaster period (denoted Case 1 and Case 2), together with the relevant excessive-pricing and price-gouging benchmarks. As shown , only when considering the average of the price forecasts, can Case 1 (competitively neutral) be distinguished from Case 2 (anti-competitive). To the extent that the spike in prices does not persist in Case 1, the average price will not be in excess of the price-gouging or excessive pricing benchmarks. Only in Case 2, where it can be shown that the price was persistently higher than the benchmarks, despite the demand spike having subsided, can it be argued that excessive pricing has taken place.

While a failure to rely on a longer interval in assessing excessive pricing may raise the risk of over-enforcement in some cases, it may raise the risk of under-enforcement in other cases. Consider a variant of Case 2, where the realised price increase is muted, such that it falls below the excessive pricing benchmark, but does not return to its original level. A hasty investigation, with a limited interval following the demand spike, will not flag this problematic case, implying under-enforcement.

Figs 1 and 2 suggest that an excessive-pricing and a comparatively generous price-gouging benchmark will deliver similar price forecasts in the presence of demand spikes, provided a sufficient interval of assessment. However, if demand is persistently elevated during the disaster period, Fig. 1 suggests that the benchmarks produce markedly different price forecasts. As shown below, reliance on a price-gouging benchmark would flag a further set of potentially anti-competitive cases, which would not ordinarily attract scrutiny under an excessive-pricing benchmark.

Similar to Figs 2 and 3 shows two realised prices, together with the relevant excessive-pricing and price-gouging benchmarks. The first realised price (denoted the "simple case") exceeds the higher excessive-pricing benchmark and would attract an investigation under the standard approach. The second realised price (denoted the "harder case") falls between the two benchmarks. Judging this price as excessive requires price responses to elevated demand during the crisis period to be judged differently to price responses to "normal" demand during the pre-disaster period. As argued, competition authorities would

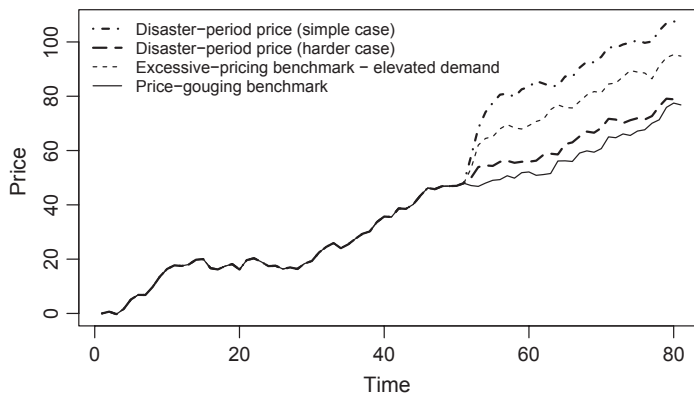*Figure 3. Elevated demand and excessive pricing*

find it hard to justify that the elasticity of *competitive* prices with respect to demand must necessarily be lower during disaster periods.

The simulation exercise offers two insights for enforcement against excessive pricing during the COVID-19 disaster period. First, it is not necessarily inappropriate for excessive-pricing policy to be pursued as a price-gouging tool in the presence of cases involving demand spikes. Price-gouging and excessive-pricing benchmarks produce similar price forecasts, provided that a sufficient forecast interval is allowed. Competition practitioners must however *(i)* reach a sufficient understanding of the nature of the demand response in any particular case and *(ii)* ensure that an interval of appropriate duration is allowed, again based on a case-specific understanding of the dynamics of price behaviour.

Such an approach would be consistent with the general approach to price gouging elsewhere. Wilson (2014) documents various instances over the past four hundred years where natural disasters gave rise to claims of significant price increases. Older examples include increases in fish prices following the Great Fire in London (+300%) and increases in transport wagon prices following the San Francisco earthquake in 1906 (+200%). Contemporary examples include claims of gasoline price gouging following Hurricane Katrina (+46% on average) and several other hurricanes as well as claims of exorbitant price increases in building supplies and services following the Christchurch earthquakes in New Zealand. Wilson (2014) documents the empirical record on these price increases, which suggests that price spikes – where confirmed – are often limited to shorter intervals. In many of these modern examples, there has been strong political support for policy action, although Wilson has noted that the short time horizons have usually limited concrete interventions.

Second, if the demand evaluation suggests elevated demand – rather than a mere demand spike – and if price falls between the excessive-pricing and price-gouging benchmarks, it is critical to justify why price responses to abnormally high demand over a sustained period – *i.e.* to elevated demand beyond that predicted by its pre-disaster trajectory – must be treated differently. This justification ensures that the focus of excessive-pricing policy – even when applied in disaster periods – remains on market-power-related abuses and harm to competition. It is also consistent with the earlier arguments concerning changes in market power as the basis for an intertemporal benchmark.

While our simulation exercise also emphasises the importance of an interval of sufficient duration, the requirement for a longer interval need not be incompatible with the COVID-19 policy aim of rapidly prosecuting abuses of temporary market power. All that is required is a sufficient period for equilibrium adjustment, as is evident from the brief discussion of completed cases that follows.

7. EVALUATION OF SOUTH AFRICAN COVID-19 EXCESSIVE-PRICING CASES

Since March 2020, South African competition authorities have been active in pursuing excessive-pricing cases based on the new regulations. To consider the extent to which enforcement has been sensitive to the distinction between demand spikes and elevated demand – and the associated need for a sufficient interval – we distinguish between cases against smaller firms in narrow geographic markets (the majority of cases) and cases against larger firms that meet the traditional requirements for dominance.

Settlement agreements were concluded with several small respondents in the first months of the disaster period. Table 1 shows agreements concluded until May 2020, with subsequent settlements following similar patterns. The cases involve small retailers (mostly individual pharmacies) facing a demand spike for, or panic buying of, either hand sanitiser or face masks at the start of the national disaster period. Even though market-wide demand for hand sanitiser or face masks may remain elevated for the duration

Table 1. Consent agreements involving COVID-19 excessive pricing

Respondent	Case Number	Product	Price or profit increase	Interval of investigation
Centrum Pharmacy	CO005Apr20	Surgical masks	Price increase not mentioned explicitly; Profit margin of 150% during March 2020 (not known before)	March 2020
Main Hardware	CO007Apr20	Surgical gloves	Price increase 71% and markup increase 19.75%	Two days from 18 March to 20 March
Van Heerden Pharmacy Group	CO014Apr20	Hand sanitisers	Price increase not reported; average markup of 42% considered "unreasonably high for an essential product"	March 2020
Van Heerden Pharmacy Group	CO011Apr20	Face masks	Markup increase of over 300%	February to March 2020
Mandini Pharmacy	CO013Apr20	Face masks	Price or markup increase not reported; average markup of 50% (and profit margin) considered a contravention	March 2020
Matus	CO012Apr20	Dust masks	Markup increase from February to March	March 2020
Evergreens Fresh Market	CO009Apr20	Hand sanitiser	Price or markup increase not reported; average markup of 33%	March 2020
Seaside Pharmacy	CO020May20	Hand sanitisers and face masks	Mark-up of 63% on hand sanitiser and 44.95% on face masks considered contravention of Competition Act	March and April 2020
Merlot Pharmacy	CO018May20	Hand sanitisers and face masks	Price or markup increase not reported; considered a contravention	March and April 2020
Naturally Yours Weleda Pharmacies	CO017May20	Hand sanitisers	Mark-up of 50% considered contravention	March 2020
Domoney Brothers	CO022May20	Dust masks	Mark-up of 56% in February and 262% in March	February and March 2020
Sunset Pharmacy	CO016May20	Face masks	Mark-up of 41% in March	March 2020
Manhattan Cosmetics	CO019May20	Hand sanitisers	Mark-up not reported but found in contravention	March 2020
Cedar Pharmaceuticals t/a Bel-Kem	CO015May20	Hand sanitisers	Mark-up not reported but found in contravention	March 2020

of the disaster period, the initial spike in demand at these individual retailers is likely to have subsided significantly and rapidly, as new supply became quickly available during the course of March and April.

The benchmark relied upon was not always an intertemporal benchmark. A selection of the cases involve firms selling hand sanitiser or face masks *for the first time*. It is not clear from the limited information available in the published Tribunal orders on which benchmark the Competition Commission had relied in these cases, given the absence of retrospective prices or margins. The remainder of the cases appear to apply an intertemporal comparison. Furthermore, in these cases, the requirements set down by the simulation exercises appear to have been broadly met. Based on the limited information available from the Tribunal orders, it appears that price responses to demand and cost were relatively quick in these cases, implying a shorter interval for dynamic price adjustment. In addition, it would have been relatively clear in these cases that the demand spike had subsided after a few weeks. Consequently, these cases involve a reasonably straightforward judgement of whether price continued to exceed the higher level justified by the initial demand spike and, hence, whether the price is excessive. In this sense, these cases appear to meet the requirements set down by the simulation exercise.

In addition to the cases settled by consent agreement, the authorities have also completed a contested case, involving Babelegi Workwear Overall Manufacturers & Industrial Supplies CC (Babelegi), a small wholesaler, for excessive pricing of its face masks (Case number CR003Apr20). In this case, the Tribunal noted price increases from January to March 2020 in comparison to prices in December 2019 (see also Frank, 2020), confirming its reliance on an intertemporal benchmark. In relation to the earlier arguments (see section 5.3) concerning the appropriate length of the benchmark period, it is noteworthy that the competition authorities and the Tribunal did not consider themselves bound to rely on prices from the three months preceding the disaster period for benchmarking purposes: the Babelegi complaint focused on pricing behaviour *prior* to the start of the disaster period. Indeed, in its judgement against Babelegi, the Tribunal emphasised the substantial differences in calculated profit and price increases for alternative benchmark periods.

The Tribunal found that Babelegi's price increases were not consistent with cost increases. Furthermore, the Tribunal noted that the price increases occurred prior to the cost increases, which suggests that it did not consider demand fluctuations as a driver of competitive pricing. Given that this case involves a wholesaler supplying to various clients, demand may well have remained elevated (compared to pre-disaster levels) after the initial spike in demand, which would require further analysis, similar to the final case against Dis-Chem, noted below. At the time of writing, Babelegi's appeal against the decision was yet to be heard by the Competition Appeals Court.

In keeping with its standard practice of prosecuting large firms, the Commission also brought a case against Dis-Chem, a large pharmacy group in South Africa, for price increases between 42% and 261% on some of its surgical face mask products (Case number CR008Apr20). Again, the implications of our earlier simulation evidence suggest that the Commission should have considered whether Dis-Chem faced sustained higher demand for its face masks, rather than a mere spike. It is plausible that Dis-Chem, as a more sophisticated buyer than the individual pharmacies involved in the consent agreements, would not have acquired substantially more face masks, without judging demand to be elevated over this period. However, in its judgement, the Tribunal did not consider

whether demand was permanently elevated. There was significant debate during the trial about the appropriate horizon for the long run, especially in light of societal pressure for swift policy action. Yet a requirement to ascertain whether increased demand is persistent does not necessarily, or always, imply a long lag for policy action. Sales and sales orders, for example, may be used to determine the persistence of increased demand in a matter of weeks. If the demand increase is confirmed to be transitory, it will be comparatively easy to assess whether price increases have also been transitory, so that it would be possible to prosecute short-term price increases. eOn the other hand, to the extent that the Babelegi and Dis-Chem cases are characterised by elevated demand, rather than transitory demand spikes, the benchmark for excessive pricing in such cases cannot be a price-gouging benchmark (*i.e.* one predominantly based on cost).

The brief overview of completed excessive-pricing cases during the disaster period suggests that the policy decision to implement a reverse legal onus (on respondents), and to accelerate adjudication of excessive pricing cases, may be merited in those cases dealing with spikes in demand. These circumstances are also closer to the ones contemplated in traditional price-gouging policy. Cases involving sustained higher demand during the disaster period, however, requires an approach closer to that employed in conventional cases. In such cases, the elasticity of price, with respect to abnormal demand, must be better understood, including to what extent a different competitive reaction is to be expected. The subsequent judgements may clarify matters.

8. CONCLUSIONS

During times of extreme economic disruption, prices of food and other essential goods and services may rise significantly. Such price increases, and their accompanying consumer welfare effects, have often attracted policy intervention. Periods of war and natural disasters are often associated with various forms of price control, as the introduction and enforcement of price-gouging laws and regulations in various jurisdictions have shown. As part of their response to the COVID-19 disaster, South African policymakers have elected to rely – predominantly – on competition policy to deal with price increases.

South African policymakers introduced excessive-pricing regulations applicable during the period of national disaster, which prohibit price increases that do not correspond to cost increases or which result in changes in profit margins compared to the pre-disaster period. A focus on competition policy, as an expansive tool to address price gouging and other pricing concerns, is novel in the international context. Historically, the prosecution of excessive pricing – both in South Africa and abroad – is limited to select high-profile cases, partly because of the complexity of analysis required. In contrast, the re-allocation of resources within the South African competition authorities have allowed expansive screening of complaints and prosecution during the disaster period. An expanded enforcement effort raises the question of whether COVID-19-related excessive-pricing investigations involve *less* complex analysis.

The complexity of analysis in excessive-pricing investigations is, too a significant extent, determined by the relevant benchmark used in judging whether prices are excessive. In this regard, this paper delivers five key insights.

First, the paper argues that the COVID-19 excessive-pricing regulations introduce an intertemporal benchmark for the evaluation of excessive pricing. The regulations require

a comparison of prices during the period under investigation (the disaster period) with prices during the pre-disaster period, which are considered to represent a more competitive period. International experience, and the associated economics literature, support intemporal benchmarks as preferable to other benchmarks, including cost-based benchmarks or comparisons against prices in other geographic markets: the data for intertemporal comparisons are easier to obtain and avoid difficult accounting cost and profit calculation exercises.

Second, the paper argues that the basis of an intertemporal assessment is the presence of a structural shift that causes a change in competitive conditions. In COVID-19 cases, this structural shift must be shown to be related to either or both changes in consumer behaviour and weakened entry during the disaster period. This underlines the importance of the market power assessment, which should precede the pricing analysis. While the consent agreements listed earlier often contain references to "temporal market power" during the disaster, the extent of case-specific analysis is unclear: the consent agreements rely heavily on an approach that views the ability to implement excessive price increases a sufficient condition for possessing market power. This behavioural view of market power requires further academic scrutiny.

Third, and importantly, the paper highlights that the structural shift associated with the COVID-19 crisis is also associated with a surge in demand and/or cost. The paper emphasises that price responses to demand or cost surges are not incompatible with competitive behaviour, as such surges may cause prices to rise significantly even in competitive markets. Consequently, intertemporal comparisons must always be conditional on demand and cost drivers. The COVID-19 regulations do not appear to reflect this position: while allowance is made for cost-based price increases during the disaster period, demand-based increases receive no explicit attention. In this sense, COVID-19 excessive-pricing regulations may be interpreted as price-gouging regulations: price-gouging policy does not typically allow for demand-based price increases following a natural disaster, though it often allows for cost-based increases.

Fourth, the paper relies on an econometric methodology, drawn from the empirical cartel literature, to study the differences and similarities of a price-gouging and a standard excessive-pricing benchmark. Using simulations, the paper shows that the nature of the disaster-period demand surge determines the extent to which a price-gouging benchmark differs from a standard excessive-pricing benchmark. Provided that a sufficient period is allowed for calculating benchmark prices, the two benchmarks deliver similar average prices following a transitory *demand spike*: if competition authorities allow a sufficient time period for price responses to demand and cost changes, the distinction between price gouging and excessive pricing becomes less relevant. A sufficient time period allows clear distinction between cases involving a temporary upshot in price, which subsequently returns to the benchmark level, and cases involving sustained price increases over a longer period. The former are likely "normal" market reactions to uncertainty, whereas the latter should potential attract antitrust scrutiny.

The two benchmarks differ substantially if demand is permanently elevated over the disaster period. Again, for those cases involving sustained price increases beyond the standard benchmark, excessive pricing will be easy to identify. But, in the case of elevated demand, price increases below the standard excessive-pricing benchmark, but above the price-gouging benchmark, will present particular difficulties. Viewing such prices as

excessive implies that price responses to demand during the disaster period are viewed different to those in the pre-disaster period. While one portion of the literature supports an assumption that price competition may be heavier during periods of high demand, other evidence points to the contrary. This requires case-by-case evaluation. In practice, such evaluation need not involve econometric analysis, and it is preferable to employ multiple analytical approaches. But even qualitative analysis will have to pay careful attention to the impact of demand and cost drivers on price.

Fifth, the paper studies the extent to which the completed COVID-19 cases in South Africa (finalised in April and May 2020) have followed the principles elucidated by the simulation exercise. These cases all involve smaller retailers (often pharmacies) selling hand sanitiser and face masks, which would not ordinarily attract antitrust scrutiny. For those retailers that have been selling these items pre-disaster, the approach adopted (as described in the consent agreements) appears largely consistent with the guidance from the simulation results, to the extent that these cases involve retailers dealing with a demand spike. Even so, the intertemporal benchmark has not been consistently applied in those cases where firms introduced a new product. Furthermore, for the on-going cases involving especially larger retailers (Dis-Chem), ignoring elevated demand over the disaster period raises significant challenges for the economic analysis. If competition authorities treat pricing behaviour without acknowledging structurally higher demand for the duration of the disaster period they may significantly impair the functioning of markets, especially if they lead to shortages.

In sum, a greater policy emphasis on intertemporal benchmarking in excessive-pricing cases is a welcome development. It is particularly useful in the context of the COVID-19 disaster, where the disaster may provide a structural shift directly linked to market power. The challenge, however, lies with obtaining case-specific evidence of such market power and with understanding the nature of the demand shock associated with the disaster. Especially the latter will be important in justifying using excessive-pricing cases as price gouging tools against smaller players. The role of a sufficient time period, even if much shorter than the traditional horizon, will be critical in this regard, to avoid both over- and under-enforcement errors.

One of the critical remaining issues concerns the impact of demand spikes on vulnerable households, especially in those cases where the horizon of the price spike is too short to support competition policy intervention. The older literature on price gouging suggests that policymakers can support households (and, simultaneously, maintain functioning markets) by ensuring that supply chains remain operative. Functioning supply chains ensures quicker supply responses to any demand increase. In this regard, the relatively limited price increases in food during the first months of the disaster period can be linked to pro-active management of supply chains, in part due to coordination facilitated by government. In some instances, however, supply coordination may not be sufficient and other forms of government support – such as the increased income support provided to poorer households – may be required.

<div align="center">REFERENCES</div>

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